

AMENDMENTS TO THE CLAIMS

1. (Cancelled) .
2. (Cancelled) .
3. (Cancelled) .
4. (Cancelled) .
5. (Cancelled) .
6. (Cancelled) .
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12. (Cancelled) .
13. (Cancelled) .
14. (Cancelled) .
15. (Cancelled) .

16. (Cancelled).

17. (Cancelled).

18. (Cancelled).

19. (Cancelled).

20. (Cancelled).

21. (Cancelled).

22. (Cancelled).

23. (Cancelled).

24. (Previously Amended) A method for assessing in vitro the agronomical fitness of a plant as measured by its seed yield, comprising the steps of:

- a.) subjecting an explant of said plant to a stress condition;
- b.) measuring the electron flow in the mitochondrial electron transport chain to assess agronomical fitness in cells of said explant of said plant;
- c.) comparing said measurement to that of explants of control plants or control plant material, under the same conditions as for said explants of said plant, wherein the greater the amount of electron flow the fitter said plant.

25. (Previously Presented) The method of Claim 24, wherein said electron flow in the mitochondrial electron transport

chain is determined by measuring the capacity of said explant subjected to said stress condition to reduce 2,3,5-triphenyltetrazolium chloride.

26. (Previously Presented) The method of Claim 24, wherein said electron flow in the mitochondrial electron transport chain is determined by measuring the capacity of said explant subjected to said stress condition to reduce 3-(4,5-dimethylthiazol-2-yl)-2,5 diphenyl-2H-tetrazolium.

27. (Previously Presented) The method of Claim 24, wherein said stress condition is selected from salt stress, osmotic stress, stress by incubation in the presence of an inhibitor of poly-ADP-ribose polymerase, stress from extreme temperatures, stress by treatment with sublethal doses of chemicals, stress by treatment with sublethal doses of herbicides, stress by treatment with sublethal doses of heavy metals, or stress by irradiation with UV.

28. (Previously Presented) The method of Claim 24, wherein said stress condition is salt stress.

29. (Previously Presented) The method of Claim 28, wherein said salt stress is induced by incubation in K-phosphate buffer comprising between 10 mM and 80 mM K-phosphate.

30. (Previously Presented) The method of Claim 24, wherein said stress condition is osmotic stress.

31. (Previously Presented) The method of Claim 30, wherein said osmotic stress is induced by incubation in a buffer comprising about 2% sucrose.

32. (Previously Presented) The method of Claim 24, wherein said stress condition is incubation in the presence of an inhibitor of poly-ADP-ribose polymerase.

33. (Currently Amended) The method of Claim 32, wherein said inhibitor of poly-ADP-ribose polymerase is selected from niacinamide, picolinamide, 5-methyl nicotinamide, methylxanthine, thymidine, benzamide, 3-methoxybenzamide, 3-aminobenzamide, 2-aminobenzamide, pyrazinamide, ~~theobromine~~ theobromine and theophylline.

34. (Previously Presented) The method of Claim 32, wherein said inhibitor is present in a concentration from about 100 mg/L to about 1,000 mg/L.

35. (Previously Presented) The method of Claim 24, wherein said explant is selected from callus, hypocotyl explants, shoots, leaf disks or whole leaves.

36. (Previously Presented) The method of Claim 24, wherein said plant is a transgenic plant.

37. (Previously Presented) The method of Claim 24, wherein said plant is a Brassica plant.